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Development of the Advanced Unified EM Design Code

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M&S Workshop

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Overview

- Background information
- Advanced development objectives
- Technical improvements
 - Functionality
 - Maintenance
- Verification and Validation plans
- Users' Meeting
- Conclusion

Background

- **JCS memo on combined battlefield environmental effects initiative, c. 1994**
- **Combined Battlefield Environmental Effects Initiative, 1995 - 1998**
 - Unified Protection Concept
 - Allocation Methodology
 - Evaluated Military and Commercial Standards
 - Prototype Unified EM Design Tool
- **Unified EM Design & Test Protocols Program, 1999 – 2004, Version 1.6**
- **Advanced Unified EM Design Program, 2005-2007**

What is Unified EM Design?

- Explorer style user's interface
- Detailed information on
 - environments,
 - immunities,
 - margins, and
 - transfer functions
- On-line help including protection methodology
- Develops barrier performance requirements
 - Based on specified environments and immunities
 - Unified requirement across all environments
- Web page at www.uemdesign.com

Program Objectives

- Add to the existing functionality of the UEM Design software package with advanced algorithms and user capabilities.
- Maintain and expand the information in the UEM Design software's data base and upgrade the software as necessary for use on current and future computer systems.
- Demonstrate the validity of the UEM Design methodology.

Enhanced Functionality

- Internal coupling
 - Topology issue
 - Internal fields
 - Re-radiation
- System design process
 - Develop additional example system models
 - Investigate methods for improving system model development

Maintenance

- Information
 - Additional environments and immunities
 - Additional versions of MIL-STD-461
 - Unclassified high power EM environments from IEC standard and IEEE EMC special issue
 - Data base entries as opposed to software modifications
- Software
 - Review program trouble reports
 - Prioritize and correct as needed to ensure operation of the software
 - Verify software on new operating systems

Verification and Validation

- Documented V&V to support application during a system development program
- DTRA has made V&V a critical activity for the advanced software development effort
- Strawman validation effort includes design, implementation, and testing of simple system with multiple EM environments

Users' Meeting Overview

- Wednesday, April 6, 2005
- Attendance limited to current and potential UEM Design users
 - US Citizen, and
 - Government agency or Government contractor
- Activities
 - Overview of planned updates
 - Hands-on demonstrations
 - Polling of user community to determine interest in future modifications
 - Basic training for new users
- Sign-up for software for qualified users

Summary

- Unified EM Design tool provides users with:
 - detailed environment and immunity descriptions
 - system level analysis to determine barrier performance requirements
- Version 1.6 released in March 2003
- Advanced development underway
 - Enhanced Functionality
 - Maintenance
 - Verification and Validation

Users' Meeting Activities

- Overview of planned updates
- Hands-on demonstrations
- Polling of user community to determine interest in future modifications
- Basic training for new users
 - Unified EM Protection Methodology
 - Quick tour
 - EM Quantities
 - System design example